

Abstract

The paper describes the use of smart multibeam antenna or multiple antennas with a smart modem that uses A packet based protocol . Smart antennas are multi narrow beam antennas in one antenna housing shown in Fig. AM.1 and Fig. AM.2.

Description

The modem network uses a packet protocol, in which there is a field in the packet that tells the modem which antenna or which antenna beam to use . If the information in such field indicates a routed packet as well as a particular antenna identification number or in modems using smart antennas it will be a beam identification . Fig. AM.3 shows the BTS communicating over beam #1 to house A or building A and as the modem in house A or building A looks at a field in the packet, it will know t route to house B or building B using beam #8 of the smart antenna. This establishes a routed beam in space versus a beam that covers all directions, making the system more resilient . It will also make the system cause less interference to other systems. Fig. AM.4 shows a house or building E communicating with BTS, and based on a fields in the packet, the modem will determine whether to use antenna #1 or antenna #2 to route the packets. Antenna #1 and antenna #2 could be directional antennas or a combination of directional as well as omnidirectional.

Claims

To further define the use of multiple antennas or a multibeam antenna in a modem ,
Base station network we claim:

1. A packet protocol based wireless network where there is modems and a base station
Exchanging packets in a known packet format where there is a field that identifies:
 - a. An antenna number where the packet is received on and an antenna number
Where the packet is retransmitted on at the receiving modem.
 - b. In a multibeam antenna a configuration field shall describe the beam number
Where the packet is received on and a beam number where the packet is
transmitted on.

The beam numbers or the antenna numbers are not necessarily the same , and
They can be same if needed.

2. In a configuration where a modem has a multibeam antenna or multiple
Antennas , the modem will search for a base station reception by scanning
Through the multibeam or the different antennas connect to it until it
Finds a base station further eliminating human intervention to adjust the
Direction of the antennas.

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Abstract: The paper describes the use of Smart Antennas with the Cellular IP Modem Network.

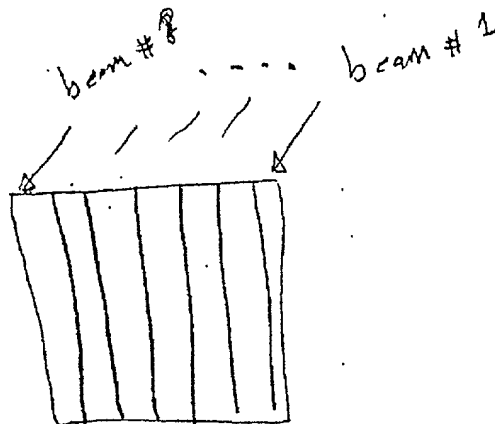
Smart Antennas are multi narrow beam antennas in one antenna housing. shown in Fig Am.1 and Fig Am.2

Description: The cellular IP modem network uses the cellular IP packet protocol, in which there are the fields status and type defined in the packet description. If the information in those fields indicate a routed packet as well as a particular antenna identification number or in modems using smart antennas it will be a beam identification number.

Fig AM3 shows the BTS communicating over beam #1 to house A or bldg A and as the modem in house A or bldg A looks at status or type fields it will know to route to house B or bldg B using beam #8 of the smart antenna. This establishes a routed beam in space versus a beam that covers all directions making the system more resilient to interference. It will also make the system cause less interference to other systems.

Fig AM4 shows a house or bldg E communicating with BTS and based on status and type fields the modem will determine

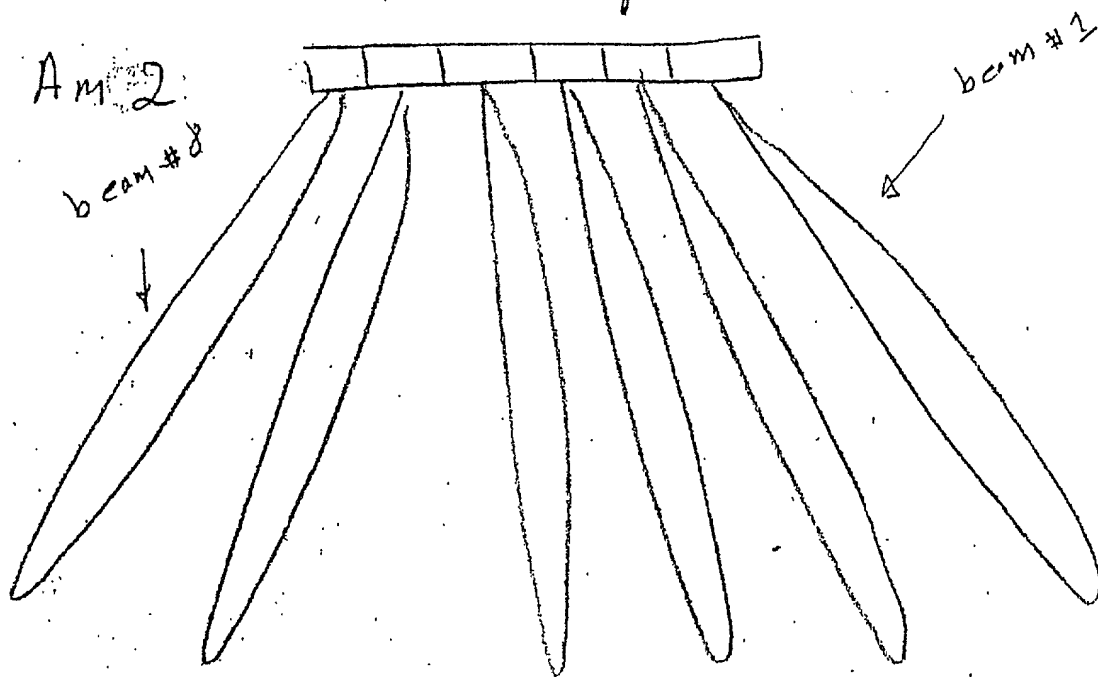
Fig A m 1 →
Front view
of Antenna



Multi antenna elements
Antenna "smart antenna"

Fig A m 2

Top view of Antenna



multi beam pattern
of multi elements Antenna

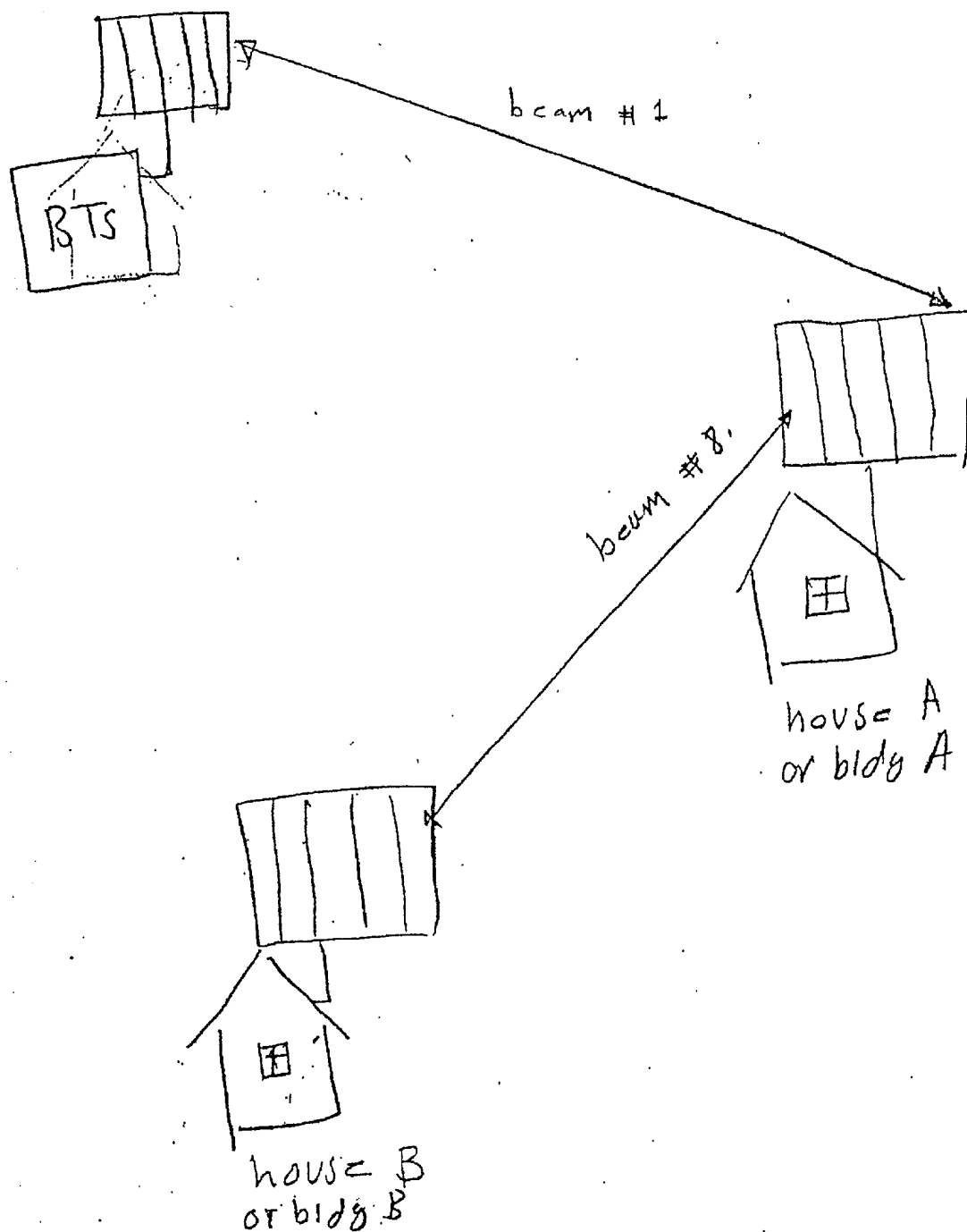
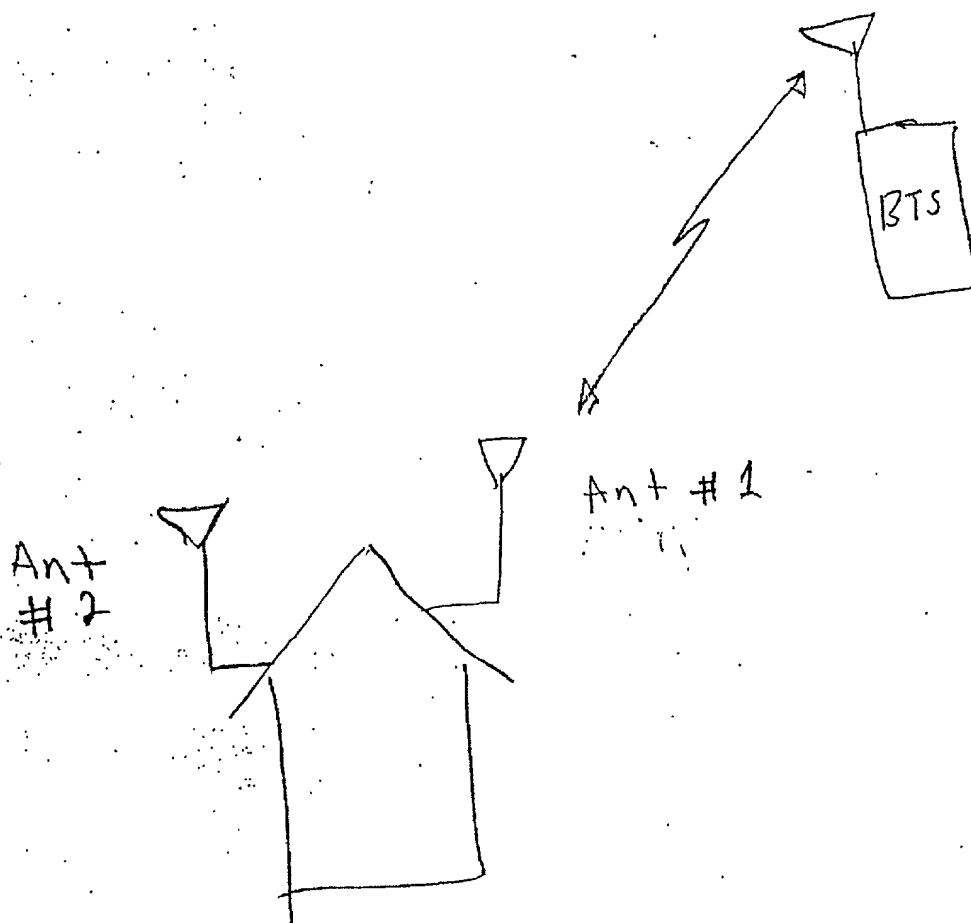


Fig AM 3 Cellular IP cell
Using "Smart
Antennas"

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House
or bldg E

Fig Am 4

Whether to use Ant # 1 or Ant # 2
to route the cellular IP packets.

Ant # 1 and Ant # 2 could be
directional Antennas or a
combination of directional as well
as omnidirectional.

Claims: To further define the function
of the status and type
fields of the cellular IP
protocol by extending the
support of multiple Antennas
as shown in Fig. AM 4 or
by using smart Antennas
as shown in Fig. AM 1, AM 2
and AM 3.